

# UK Patent Application

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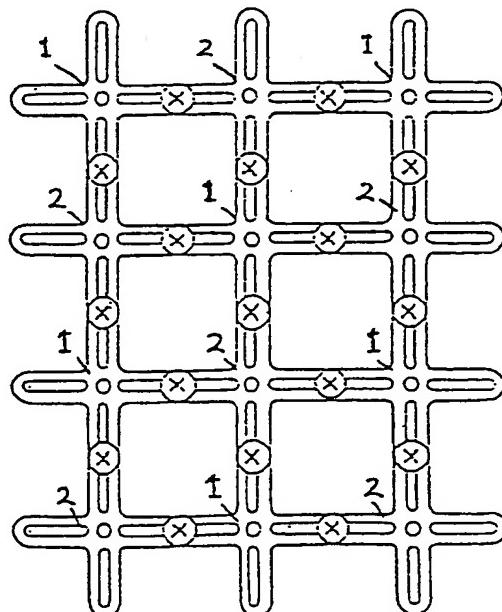
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GB 0594648 A

(58) Field of search  
UK CL (Edition K) F2M ME  
INT CL<sup>6</sup> F16B  
Online databases: WPI

## (54) Modular re-shapeable system

(57) A flexible re-shapeable system comprising a multiplicity of modules (1, 2) which are releasably joined together to form a "sheet" which can be adjusted in its shape, eg to provide adjustable support in a seat. The system provides for limited adjustment of adjoining modules with respect to each other, in which the modules have central holes to permit their connection to a support by connecting means as well as outwardly-extending arms or other portions provided with slots by which adjoining modules are connected to each other by connectors arranged to pass through the slots of overlapping arms or portions of the adjoining modules.

FIG. 3



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

The print reflects an assignment of the application under the provisions of Section 30 of the Patents Act 1977.

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FIG 1

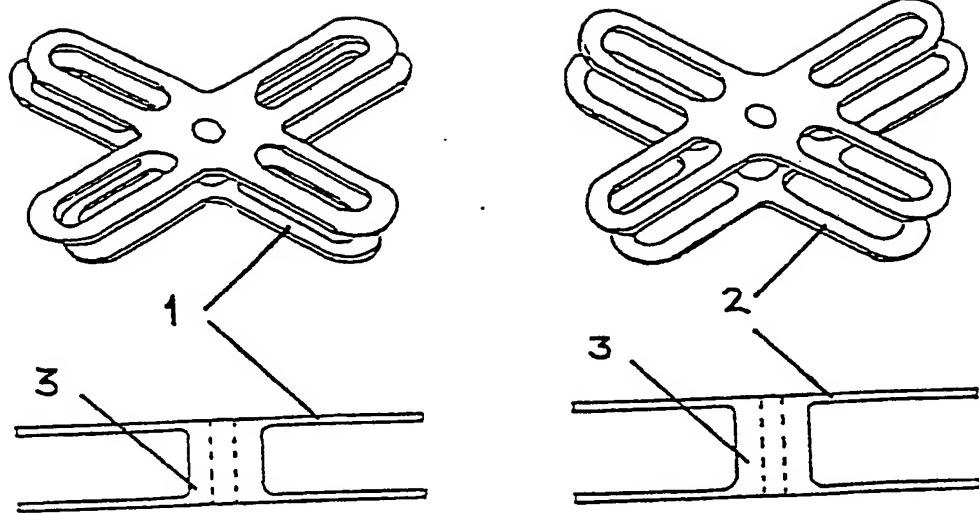


FIG 2

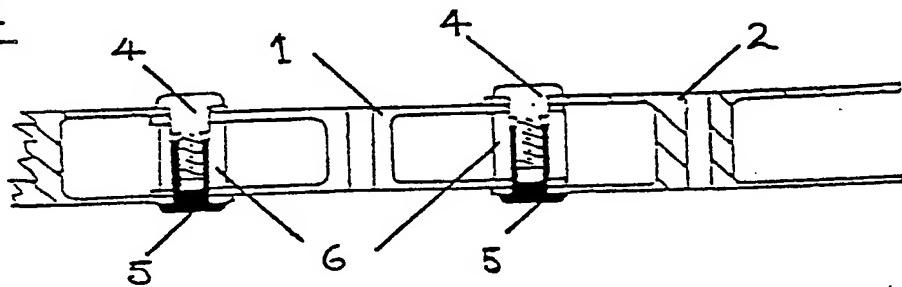


FIG 2

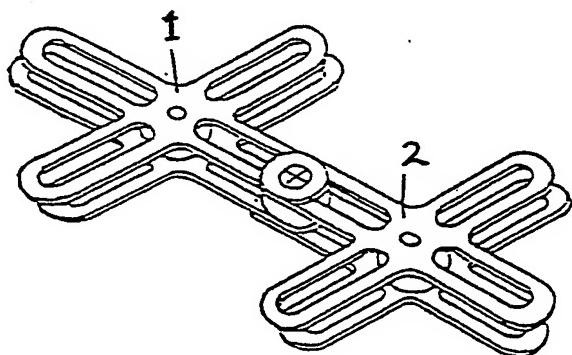
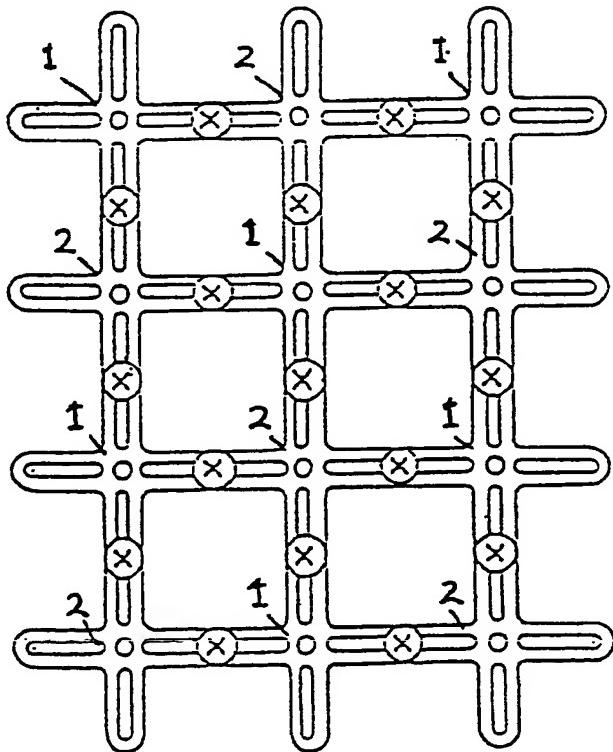


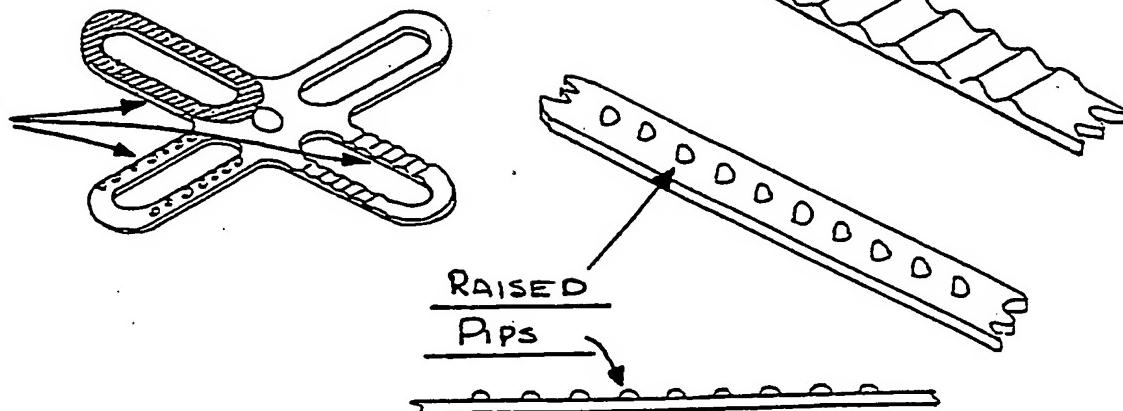
FIG 3



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FIG 4

ROUGHENED  
FINISH



FRICITION WASHER

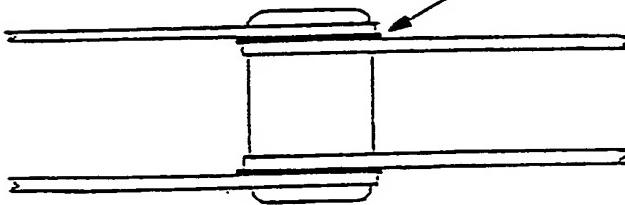


FIG 6

SLIDING FIT

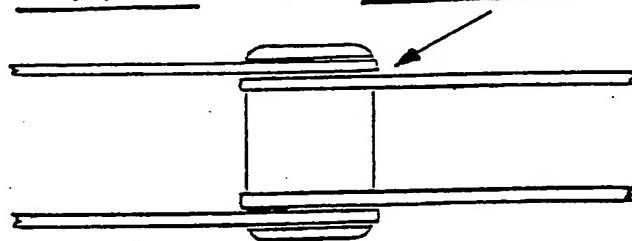
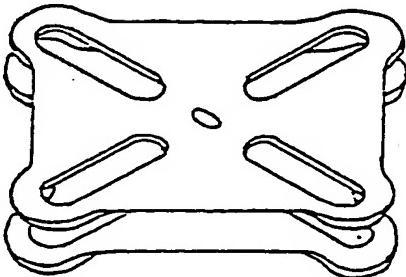


FIG 5



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FIG 7

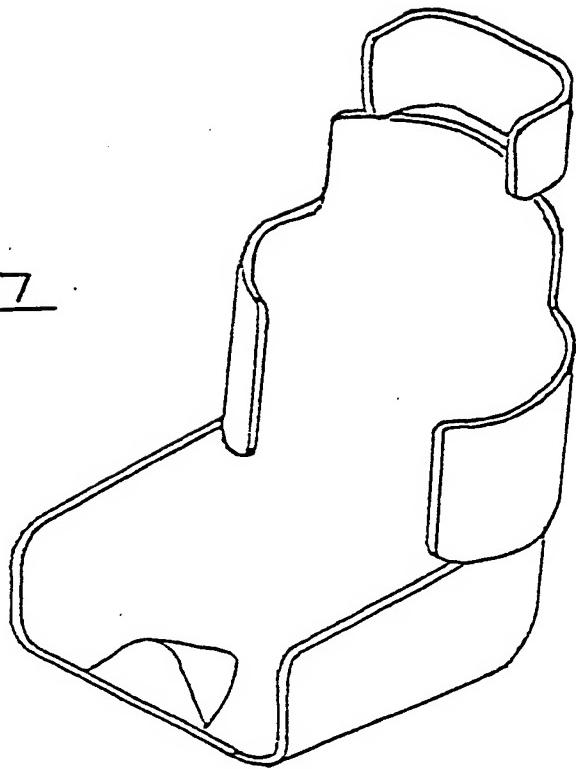
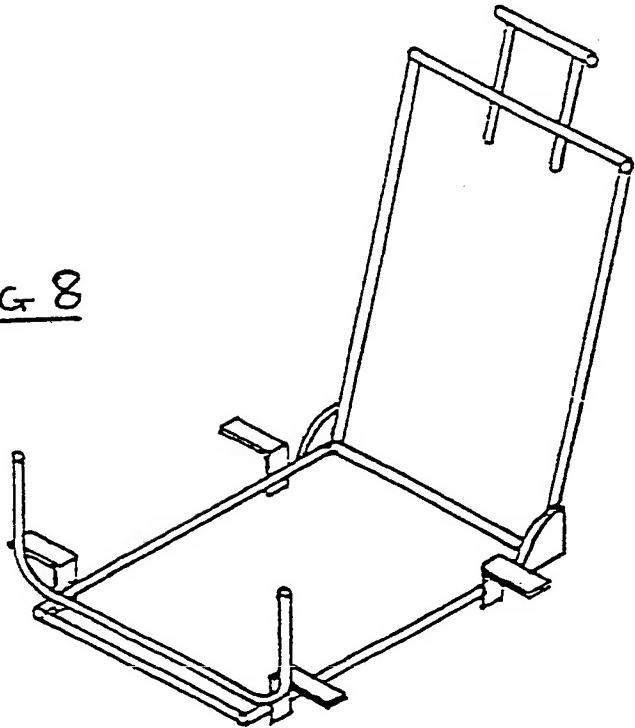


FIG 8



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FIG. 9

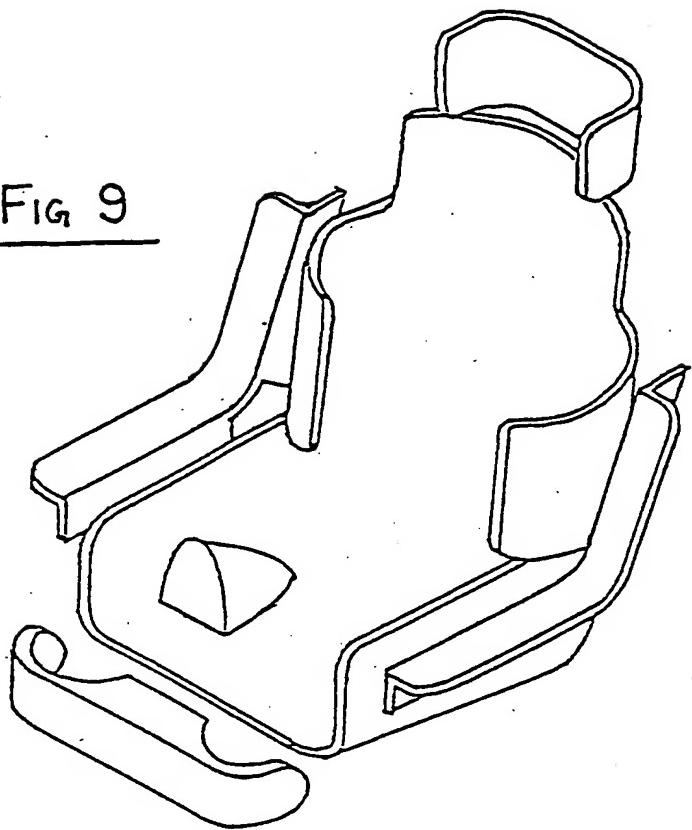
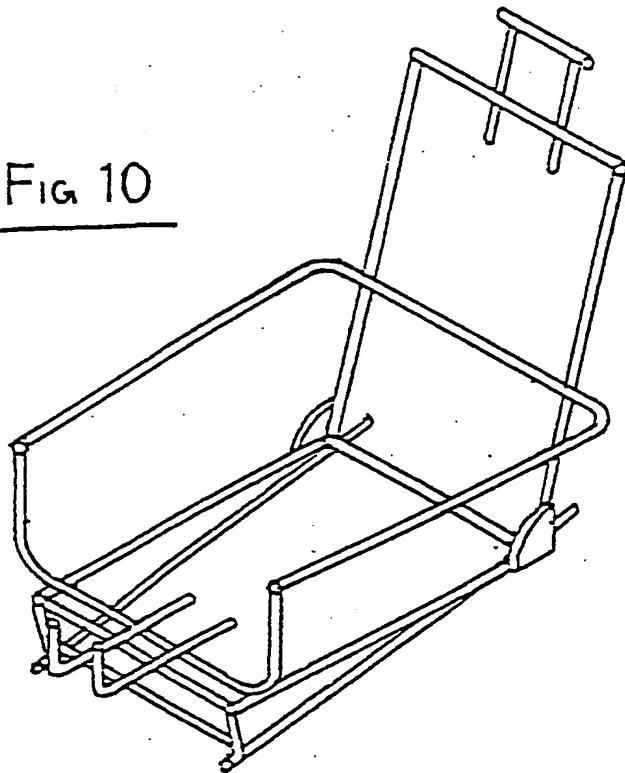


FIG. 10



Modular Re-shapeable System

This invention relates to a flexible re-shapeable system for specialised seating and other uses. It has been developed in its basic form for the production of shapeable/re-shapeable sheets for use in seating, mainly for the disabled of all ages. It has, however, other commercial uses such as splint bracing, the production of prototypes and replicas of models, and many other applications requiring a cheap shapeable/re-shapeable system.

Disabled and physically handicapped people often have to be seated for long periods during the day, often without the ability to re-adjust their position. This can cause many problems associated with their well-being both clinically and mentally. In particular, if a disabled person is not well supported in a comfortable and secure position for long periods - bearing in mind their clinical requirements - they can become agitated and their clinical condition can deteriorate rapidly, possibly causing problems with breathing, spinal, and most important, pressure sores which can be potentially lethal if not carefully nursed.

It is accordingly an aim of the present invention to provide a re-shapeable system which overcomes the above problems and which also allows for growth of young children and changing physical conditions of any patient while

avoiding the major cost of many present systems which require expensive alterations or which have to be totally scrapped and remade if the patient is young and growing or has changing clinical conditions.

With this aim in view, the invention is directed to a shapeable/re-shapeable system comprising a seat and/or frame which can be readily shaped or re-shaped, thereby reducing drastically the long-term maintenance costs.

In one particular system in accordance with the invention there are two modules called "cross units". These modules comprise two identical or similar pairs of crosses joined by a central pillar which has a central hole to allow connection to a support frame. The crosses have slots along their length to allow a locking nut or bolt to pass through them and a spacer. The two modules are substantially identical in shape but have pillars of different height to allow the arms of one unit to slide between the other. When the nut or bolt is tightened, the modules are locked together. They can be released by slackening the nut or bolt. This can be performed many times, allowing many readjustments.

The system is preferably supported by a fully-adjustable framework which also acts as the basis to mount accessories such as arm rests, a tray, a head support, knee blocks and other components. An interface can be added to the base of the frame, thereby allowing the whole seating system to be connected securely to most wheelchairs and

pushchairs. This interface also allows quick removal from wheelchairs for transportation.

Some example of system in accordance with the invention are shown in the accompanying drawings, in which-

Figure 1 shows details of first and second modules, the difference between them being the overall height of the central pillar;

Figure 2 shows two modules joined by a locking screw and/or nut and with a central spacer;

Figure 3 shows a "sheet" assembled from such modules;

Figure 4 shows an alternative form of locking arms for the modules;

Figure 5 shows an alternative form of module to give a smoother finish to an assembled "sheet" of modules;

Figure 6 shows a method of allowing arms to slide;

Figure 7 shows a seat made from a sheet of modules;

Figure 8 shows a supporting framework for the seat of Figure 7;

Figure 9 shows the seat of Figure 7 with added components; and

Figure 10 shows the supporting framework of Figure 8 with added components.

Figures 1 and 2 show two modules 1, 2 which form the basic components of the system and which are moulded from synthetic plastics material or are pressed from thin metal sheet with moulded central pillars 3 riveted

together. The arms of each module can have various finishes - as in Figure 4 - to give greater friction and lockability. By adding different spacers 6 it is possible to give the arms the ability to slide between each other, thereby allowing certain areas to be made more flexible as in Figure 6.

The complete system is produced by assembling a plurality of modules 1, 2 - alternating between taller and shorter modules - to provide a "sheet" of the required size as in Figure 3. The "sheet" can then be shaped as in Figure 7 by loosening the nuts and bolts 4, 5 and then locking the nuts or bolts when the correct shape has been developed.

Should the system require a tighter shape than can be developed by the existing modules, they can be released by removing the screw or nut 4, 5 and joining the arms to a more convenient module. It will be understood that the system can be produced in various sizes and heights to increase the strength or to improve the shapeability.

A framework for the seat can be produced from two frames joined by a hinging unit as shown in Figure 8. From this support frame, extra tubes can be added as shown in Figures 9 and 10 to give more strength to the seat and also to support extra accessories. The system can be made more symmetrical by changing the basic shape of the cross units as shown in Figure 5.

CLAIMS

1. A flexible re-shapeable system comprising a multiplicity of modules which are releasably joined together and which provide for limited adjustment of adjoining modules with respect to each other, in which the modules have central holes to permit their connection to a support by connecting means as well as outwardly-extending arms or other portions provided with slots by which adjoining modules are connected to each other by connectors arranged to pass through the slots of overlapping arms or portions of the adjoining modules.
2. A system according to claim 1, in which the modules are of cruciform shape so that each one has four arms.
3. A system according to claim 1 or claim 2, in which the modules each comprise two spaced-apart plates of similar shape which are joined together at their centres by a pillar having a longitudinal hole which forms the central hole of the module.
4. A system according to any one of claims 1 to 3 having modules with arms, in which the slots in the arms are of linear elongate form and extend longitudinally of the respective arms.
5. A system according to any preceding claim, in which the connections for connecting together the overlapping arms or other portions of adjacent modules comprise nuts and bolts.

6. A system according to claim 3 or any claim appendant thereto, in which the modules are substantially the same as each other but some modules have a spacing between their two plates which is slightly less than that in other modules so as to prevent the arms or other portions of some modules to slide between the arms or other portions of other modules.

7. A system according to any preceding claim, in which the modules are connected to a support which takes the form of an adjustable framework.

8. A system according to claim 7, in which the adjustable framework is a seat frame, the modules therefore serving to form a shaped seat.

9. A system according to claim 8, in which the seat frame is adapted to form a support for one or more accessories such as arm rests, a tray, a head support, knee blocks and other components.

10. A system according to claim 8 or claim 9, in which an interface is added to a base of the frame to allow the seat to be securely connected to a wheelchair or pushchair.

11. A flexible re-shapeable system according to claim 1 substantially as described herein with reference to the accompanying drawings.

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